

R E M A R K S

After careful consideration of the outstanding Office Action, this application has been amended accordingly, and favorable reconsideration on the merits thereof is at this time respectfully requested.

The undersigned will consider the objections and rejections chronologically as set forth in the outstanding Office Action beginning at the top of page 1.

The Examiner correctly noted that reference character "5" does not appear in the drawings to identify the "measuring cone." Figure 1 has been filed both in annotated and replacement form, and this issue is now believed moot.

The Examiner also objected to claims 1, 6, 7, 11 and 14 because of "informalities" immediately following the caption entitled "**Claim Objections.**" Of the six numbered "informalities," all have been appropriately attended to by amendment, and only informality 6 need be considered, namely, the Examiner's comment that "all the reference numbers in the claims should be deleted." Reference numerals/reference characters in claims which correspond to elements recited in the specification "may be used in conjunction with the recitation of the same element or group of elements in the claims." (See MPEP, Section 806.01(m), page 600-70.) The only proviso is that the reference characters/reference numerals "should be enclosed within parenthesis so as to avoid confusion with other numbers or characters which may appear in the claims." The latter occurs in all of the claims, and since the use of such reference characters/reference numerals has "no effect" on the scope of the claims, the cancellation thereof ought not be insisted upon by an Examiner, particularly since this format

should assist in grasping the content of the claims more quickly and readily. Accordingly, the withdrawal of the requirement that "all the reference numerals in the claims should be deleted" would be most appreciated.

The Examiner also rejection claims 1, 6 and 14 under 35 U.S.C. § 112 "as being indefinite." All of the claims requiring appropriate amendment have been amended, and the only issue remaining of record appears in item 4) at the mid-portion of page 2. The Examiner quoted a phrase from claim 14, lines 6 through 8, and stated that it was not clear how the sensor (10) is focused coaxially to the direction of the high energy beam. The latter is described at page 5, last two lines through page 6, first seven lines. The latter is believed to clearly explain the coaxial focus of the sensor (10). In view of the foregoing, the withdrawal of the Section 112, rejection would be most appreciated.

The Examiner rejected claims 1 through 22 "under 35 U.S.C. 103(a) as being unpatentable over Beyer et al," and at the top of page 3 of the Office Action explained the method disclosed thereby. Admitting Beyer et al. discloses exactly that stated by the Examiner in the first paragraph at the top of page 3, the only issue then becomes the differences between that disclosed in Beyer et al. and that recited in independent claims 1 and 14, original and as amended. Claim 1 recited "measuring signals of sections of the vapour capillaries (14)" **and** "the melting zone (20)" and "simultaneously" transmitting these measuring signals to the evaluation means (18). Like limitations appear in apparatus claim 14, and the amendments to each of claims 1 and 14 further clarify that which was clear in the original claims of record.

In the Office Action at page 3, paragraph 3, the Examiner states: "Beyer does not explicitly disclose dividing the picture into sections and examining the picture sections." This is another way that Beyer et al. does not render obvious the subject matter of claims 1 and 14, because each of the latter claims call for "measuring signals of sections," as noted immediately heretofore, and further call for the simultaneous transmission thereof to the evaluation means (18). Accordingly, under Graham v. John Deere Co. of Kansas City, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966), independent claims 1 and 14 clearly recite unobvious subject matter and avoid the application of the patent to Beyer et al.

The Examiner's position with respect to obviousness is dependent upon a **conclusion** unexpressed by the prior art, either by way of motivation or suggestion, namely, "However, the artisan [sic] would have been motivated to modify Beyer's method to divide the picture into sections and examine the picture by sections to save time or to reduce the amount of measuring data." First and foremost, examining the Beyer et al. disclosure as a whole or in its entirety clearly indicates the **exclusivity** of measuring **only a single area** to determine the depth of penetration during plasma working of a workpiece. The patentees acknowledge that the intensity of the light "fluctuates strongly, however, the mean value of the intensity of the plasma beam is used as a measure for the penetration depth." Therefore, whether penetration depth or vapour capillary is determined, the sole area of sensing is within the region of the vapour capillary and all sensing is limited thereto (column 2, lines 35-65). At column 4, between lines 2 and 18, there is a description of conventional structure and at column 4, beginning at line 53 the resolution of the viewing optics in the radial direction is described as

being 0.5mm which senses or detects "the emission from the total region of the vapor capillary" (column 4, lines 55-60). Therefore, not only is the sensing limited, but the patentees go on to explain that "the measured intensity of the light of the plasma is, to a first approximation, proportional to the penetration depth of the vapor capillary in the workpiece," as well as other "machining parameters and limiting values" (column 5, lines 35-45). At column 6, between lines 60 and 63 is found the statement: "With the aid of suitable averaging, from the signal pattern in spite of the strong signal fluctuations, a mean penetration depth can be selected." The latter is the invention as evidenced by claim 1 which requires "monitoring **exclusively** a cross-section of a **vapour capillary** formed by plasma induced by said laser radiation in said workpiece" and "determining a mean value of the intensity of plasma radiation from **said vapor capillary**." The latter is the total "teaching," suggestion and/or motivation of the Beyer et al. patent. The Examiner allegedly finds therefrom or from some undisclosed source motivation "to divide the picture into sections." Dividing the Beyer et al. "picture into sections" destroys the very essence of the Beyer et al. invention and whether the same would save time or reduce the amount of measuring data received would be of no consequence if the results were indeterminate. One cannot achieve a mean value of a specific area by subsectioning an area when the sole objective thereof, again based upon the Beyer et al. patent, is that of determining penetration depth. One must have the entire mean value of the entire intensity of the plasma radiation to arrive at a measure of the penetration depth, not merely a portion thereof. Therefore, there is no basis for the Examiner's unsupported allegation concerning artisan motivation with respect to the Beyer et al. patent.

In actual fact, a further development beyond that disclosed in the applied Beyer et al. patent (5,869,805) is set forth in the description of German Patent (DE 197 41 329 C) appearing at page 2 of the present application which corresponds to U.S. Patent No. 6,326,589 (Beersiek). The description makes mention of monitoring "the area of the vapour capillaries at at least two measuring points to obtain different capillary geometry sizes." This involves "Specific areas of the picture taken by the CCD camera" but this does not involve two different areas of the workpiece and the simultaneous transmission of measuring signals to the evaluation means. Instead, the Beersiek patent monitors only the area of the vapour capillaries for the purpose of controlling and monitoring the work in process and the monitoring occurs at two measuring points within the vapour capillaries to obtain different capillary geometry sizes. Specific areas of the picture taken by the CCD camera are evaluated for determining the capillary geometry sizes, not the simultaneous sensing and transmission of sensed data from sections of the vapour capillaries and sections of the melting zone surrounding the vapour capillaries.

German Patent DE A 41 06 008 also relates to a method for on-line monitoring of a laser beam operating upon the surface of a workpiece during welding. Unfortunately, there is no U.S. counterpart of the latter patent, but the laser beam focusing device is used to direct the emitted light from an area around the work area to cylindrical lenses which focus the light onto two receiver units arranged at an angle to each other and function as a single dimension working receiver system. These receivers send out electrical signals to an evaluation unit which produces data concerning the local and/or statistical brightness distribution of the area being monitored.

There is no examination/evaluation of separate sections of separate areas, as defined in the two independent claims of record. All of this is brought to the Examiner's attention because the prior art evidences collectively the absence of any motivation or suggestion to an artisan or a person skilled in the art to provide a method of and a device for simultaneously acquiring a plurality of process parameters at a high monitoring frequency through simultaneously sensing the area of vapour capillaries and the melting zone surrounding the latter. Absent some rationale presentation on the part of the Examiner of precisely how he has reached the conclusion set forth in the Office Action at page 3, paragraph 3, the allowance of each of the independent claims of record is considered to be in order and would be most appreciated.

Quite obviously, since a person skilled in the art would never be motivated in the manner suggested by the Examiner, each of dependent claims 2, 7, 13, 15 and 17 should also be allowed, and the formal allowance of each would be most appreciated.

Insofar as claims 3 through 6, 8, 12, 19 through 20 and 22 are concerned, the Examiner stated "it would have been obvious [sic] a design choice to modify Beyer's method to measure different area [sic] of the melting zone or using different wavelengths [sic] of the beam path for different purposes." Really? Why? For what purpose or purposes? The factual inquiries reflected in Graham, supra, establish the groundwork for approaching the issue of obviousness under 35 U.S.C. § 103(a). The four factual inquiries include a determination of the scope and content of the prior art, the differences between the prior art and the claims at issue, the level of ordinary skill in the pertinent art, and objective evidence present in the

application indicating obviousness or nonobviousness. As was stated in In re Andros, 28 USPQ2d 1146, 1147:

The law is well settled that 'obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so.' *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). However, the motivation to modify the prior art to produce the claimed invention 'need not be expressly stated in one or all of the references used to show obviousness.' *Cable Electric Products, Inc. v. Genmark, Inc.*, 770 F.2d 1015, 1025, 226 USPQ 881, 886 (Fed. Cir. 1985); *In re Bozek*, 416 F.2d 1385, 163 USPQ 545 (CCPA 1969). 'Rather the test is what the combined teaching of the references would have suggested to those of ordinary skill in the art.' *Cable Electric*, 770 F.2d at 1025, 226 USPQ at 886-87 (quoting *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981)).

The Examiner speaks in terms of motivation and design choice, yet provides absolutely no basis in support of his conclusions. Stating "the artisan [sic] would have been motivated" but not stating why or how he would have been motivated renders the Examiner's position with respect to claims 2, 7, etc., questionable at best and erroneous at worst. Such is also true of the Examiner's conclusion concerning "a design choice" with respect to claims 3 through 6, etc., when the conclusion ("a design choice") lacks support through "some teaching or suggestion or incentive to do so." As was noted earlier, the motivation suggested by the Examiner with respect to claims 2, 7, etc., is contradictory of all prior art teachings/suggestions and is actually a teaching away from that taught in Beyer et al. As to the "design choice" conclusion, no mention is made whatsoever of any justification for concluding obviousness with respect to these claims absent solid evidence at least somewhat supportive of the Examiner's position. The Examiner must

first establish knowledge existent in the art before thereafter properly relying upon a conclusion of obviousness based upon common knowledge and common sense of a person of ordinary skill in the art absent any specific hint or suggestion in a particular patent. (*Cable Electric Products, Inc. v. Genmark, Inc.*, 770 F.2d 1025, 226 USPQ 886; *In re Bozek*, 416 F.2d 1390, 163 USPQ 549.) Having clearly failed to establish a *prima facie* case of obviousness based upon motivation because of the absence of common knowledge or common sense of an ordinary skilled artisan, the rejections of claims 2 through 8, 12, 13, 15, 17, 19 through 20 and 22 are erroneous and the withdrawal thereof is respectfully requested.

With respect to claims 10, 18 and 21, the Examiner states "since Beyer performs the same function as the claimed invention, Beyer inherently discloses the claimed limitations." With all due respect, the latter-quoted statement is absolutely astounding. The Examiner is predicated the rejection of a claimed invention upon the functional performance of prior art. An explanation of the latter would be most appreciated, particularly as to the manner in which this approach of the Examiner's is supported by the traditional application of the Graham factors with respect to 35 U.S.C. § 103(a).

In view of the foregoing, the formal allowance of the application is believed proper and is herewith respectfully requested.

Very respectfully,

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Attachments: Annotated sheet and Replacement Sheet of Drawings